



Museum of Natural History & Science Interpretation Guide for *Pathways to Change*

A walk through *Pathways to Change*

The beginning of the *Pathways to Change* exhibit introduces you to the relationships and adaptations found in nature. It takes food, shelter and water to make a habitat, or a home, for living things. Trees and other plants are often what we first notice providing shelter and food for a habitat. Plants also produce oxygen as a by-product of photosynthesis and the source of many products we use, like lumber. With native wildlife on display for observation and hands-on interactives, *Pathways to Change* introduces examples of physical adaptations that plants, animals and humans have to survive in their habitats. Many animals use camouflage or concealing coloration as disguises to blend in and seem to disappear into their surroundings. Animals also use disruptive coloration to visually distort their shape against their backgrounds. With mimicry, an animal takes on the characteristics or coloring of another dangerous or bad-tasting animal. Other physical adaptations, like the shape of a bird's beak, the shape of their feet or an animal's teeth, provide the right tools to collect and eat specific types of food or move across a specific landscape. One of our physical adaptations is our thumb. Try to tie your shoes or write with a pencil without using your thumb. Every living thing has adaptations for survival. Any adaptation can also change over time as the environment changes over time.

As you enter the time period of 1670, you enter the society of the Fort Ancient people. They resided in this region from 1000 to 1670. As you enter this time period you will discover this area's introduction to agriculture. The Fort Ancient people are the first to cultivate the land here. They use the slash-and-burn method of agriculture in which the smallest trees are cut down and larger ones are girdled—their bark cut in strips to kill them. Once dry, the woodpiles are burned. The Fort Ancient people grow crops like corn, beans, pumpkins and sunflowers using tools of antlers, shells, stone and bone. They also hunt, fish and gather. Pots and utensils are made of clay and turtle shells.

As you continue along the wall, uncover the evidence the Fort Ancients left underground. Winter survival depends upon the underground storage pits of food. They have no fridge and no grocery store. Look inside the food storage pit in the exhibit. What did the Fort Ancients store for the winter? If you had to make a storage pit of food for the winter, what would you put inside? Next to the food storage pit is their garbage pit. They will make pits or use any low spot for their waste. Look inside the exhibit model of their garbage pit. What evidence can you see about how the Fort Ancient people lived? Every place people live they produce waste, and one of the best ways to learn all about a

group of people is to study their garbage. What will future anthropologists uncover about you?

In the center of the exhibit is our model of a Fort Ancient village as it may have appeared in this region. Look at the village and discuss what people appear to be doing there. Are any of these activities something that happens in your neighborhood?

On the other side of the exhibit, look at the example of a Fort Ancient home. How is this home different than your home? How is this home the same as your home? Everyone in the village works together and each villager has their individual jobs to do, like hunting or making cooking tools.

Also along the wall, discover the tools of the Fort Ancient people. As you look at each tool displayed on the wall, think about how you might use each tool. Then look in the field guide below to see how each tool is actually used.

Look at the village in the middle again. Did the Fort Ancient people in the village change their environment at all? If so, how? They did clear land, cut down forest, plant crops and leave some waste, however their population was small and their waste biodegradable. Eventually, it became harder to find trees for wood and the soil for crops became less fertile. What would you do if that happened and you were in charge of the village? The Fort Ancients eventually moved away to new areas and the woods and animals returned to where they had been.

For the next 100 years or so, no one lived in the Ohio Valley.

So step through the time machine and enter the year 1750 and the arrival of European settlers. From this station for early settlers, they will explore areas to start new farms. How is this station different from the Fort Ancient village? How is it the same?

Enter the settler's cabin. Notice some of the tools and materials the early settlers use in their home. What material do you see the most? They use a lot of wood in their homes. Why do you think they used so much wood? How many things can you find in their home not made of wood?

There is still no trash pick-up day, but everyone produces waste. These early settlers tossed their garbage into any ravine or low spot outside. Much of what they discarded was biodegradable. Anything manufactured, like glass or metal tools, are hard to come by so they are usually reused or recycled. Is there anything in your home that is reused or recycled?

There is still no grocery store or department store. Products are mainly made of corn. Why do you think that is? Corn meal replaces flour in cooking and corn cakes replace bread. Settlers also hunt, fish and gather fruit and nuts.

Use the Lincoln Logs to imagine you are building your families' cabin. If each log used in your cabin equals one tree, how many trees did you cut down to make your cabin?

Where do you find out what is going on in the world? How do you find out what is going on in your neighborhood? Early settlers talk to pass stories and news along about what

is going on in the country and world. Settlers read newspapers and read notices posted on trees.

Look at the farm tools on display. During this time period, farmers are still using slash-and-burn agriculture. How are these tools different from the Fort Ancient farm tools? Look in the field guide to discover the use for each tool.

Think about this time period. Did these early settlers change their environment at all? They did deforest, or clear large areas of forest for farms, and use the wood for most of their needs. What other living things use trees as a resource? What do other living things use trees for? (Hint: think back to the beginning of *Pathways to Change*.) How might these other living things be affected as trees are deforested?

Continue through the time machine and into the 1890s. Look at the map of Cincinnati in 1890. How does this map compare to the Fort Ancient village? The 1830s brought a boom in early Cincinnati as industry changed everything fast with big machines and lots of people.

Come into the home and see how Cincinnati families lived during this time period. Look around. Compare this home to the Fort Ancient home and the Early Settler home. Is there anything that all of these homes have in common?

Look over the tools. What might you use each tool for? Look in the field guide to see how each tool is actually used.

Finally, you can walk to a grocery store! Look around the store. How is this store different from your grocery store?

The farm tools are now larger machines powered by steam or horses. Look at each of the new tool panels. Can you figure out what old tool these machines replaced? The use of steam power has made more stuff faster for a growing population of people. To create the steam, coal is mined from the earth and burned, releasing black smoke into the air.

What are some of the reasons you or your family chose to live in Cincinnati? In 19th century America, Cincinnati is one of the country's top manufacturing cities. It has a river for transporting goods and people, forests for wood, fertile soil, coal, clay for bricks and gravel.

Look around the kitchen. What kitchen supply or appliance is missing that you think you could not live without?

How do you communicate with your friends when you are apart? Do you have a cell phone? Do you text message? Do you ever e-mail or instant message people? People in this time period didn't use any of those things. Look at the kind of phone used during the time. People wrote letters and sent them through the U.S. Postal Service to communicate.

Stand outside the closed door. What do you think this is? If you open the door, you will see this is an outhouse or privy. People not only used the restroom out here, they also sometimes threw some of their trash down here.

As the 1890s are ending, pollution in Cincinnati is a serious problem. Look outside the window and imagine this Cincinnati. The Mill Creek and Ohio River carry slag waste from iron and steel mills. The rivers and creeks are also full of sewage, garbage and run-off from animal slaughterhouses, making the water run red. Then this same water is pumped as drinking water without any treatment! The air is black with clouds of smoke and soot. Would you have wanted to live in this Cincinnati? Needless to say, many people are getting sick.

If you were a leader in Cincinnati during this time, what would you do? Around this time, people in Cincinnati planned to create parks, many people moved up to the Cincinnati hills or to the west side, and a new water treatment plant is created on the east side.

We have traveled through the changes of the land and society as this area became what we know as Cincinnati. Now, we journey out of the time machine into the 1990s and modern day society.

Look at the photo of Cincinnati in the 1990s. Is this time period within your lifetime? If you live in Cincinnati, is this within the time period you have lived here?

Step into a modern kitchen. What are some the things you have in your kitchen at home the people of past time periods did not have? What are some of the modern things you think you could survive without?

Look up at the food tower. This represents how much food a family of four buys at the grocery store in one month. Now look over at the garbage mountain. This represents how much garbage a family of four puts out in a month. Where does the garbage go when it gets picked up at the curb?

Our garbage in Cincinnati goes to a landfill. Remember the ravines and low spots of the past? We don't just randomly throw our garbage in a hole. The Rumpke landfill manages our garbage with clay and plastic liners to prevent groundwater contamination, pipes to collect released decomposition gases, like methane and carbon dioxide, basins and ponds to collect water run-off, and a top cap of clay, plastic liner, and soil to keep water out. The gases collected are used by Cinergy to heat over 15,000 Cincinnati homes. When you drive north up I-75, off to the right near Reading, you can see our landfill mountain. Landfills are manageable, but they are not without limits. A landfill can run out of space and get full. Also, look at the photos of the landfill landscape. Do you live near a landfill? Would you want to?

How can we help manage the landfills we share? We can pre-cycle. When we go shopping for the products we use, think about what you are buying. Is the product or its packaging reusable or recyclable? Is there an alternative product that uses less packaging I will have to throw away? How is the product made? Reduce, reuse and recycle what you can. Look up or ask Rumpke what can be recycled in your neighborhood and how you can recycle.

Many of the small things we do at home affect the bigger picture. Global climate changes and increases in Earth's temperature are being recorded by scientists as gases like carbon dioxide trap energy from the sun near the Earth's surface. Although evidence of this greenhouse effect have been studied from the past and is a natural phenomenon, scientists are concerned because human activity is increasing the output of greenhouse

gases faster than Earth can cycle them so there is a build-up in the atmosphere. The four warmest years of the 20th century were all in the 1990s. Scientists know the greenhouse effect and global warming are happening. The question is how much is human activity altering the natural processes and changes? What will this mean for future global change and the future generations that must adapt to it?

Tropical rainforests cover less than 7 percent of the Earth's surface, but scientists believe they contain half of all plant and animal species. This is perhaps our Earth's greatest source of biodiversity. What else do rainforests provide for us? The forests have many products, like cocoa trees and fruits like bananas and mangos. We have really only begun to understand the possibilities for medicinal plants and we have already discovered over 2,000 anti-cancer agents in the rainforests. These forests also are critical to the Earth's carbon cycle, absorbing carbon from the atmosphere and recycling it into the production of oxygen.

Think about your neighborhood. Do you ever see litter or garbage people have left or thrown around? How do you feel about that? What can you do about it? Even if the smallest thing we do is keep Cincinnati clean, that will make a difference in sustaining the environment where we live. Along the left wall at the exit of *Pathways to Change*, there are many examples of the things we can do both big and small.

What kind of environment do you want to live in? How do you want the land around you to look? How do you want the air to look and be like? What do you want your water to be like? What do we need to do in our society to have those things from our environment? What do YOU need to do?